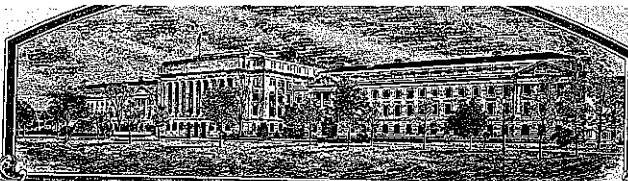


No.

200200130



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Washington State University Research Foundation

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

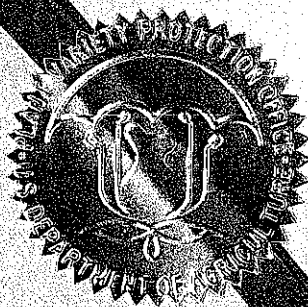
AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (34 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, COMMON

'Macon'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this sixteenth day of September, in the year two thousand two.



Attest.

Ed M. Juler

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Hereman


Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER Washington State University Research Foundation		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME WA007899	3. VARIETY NAME Macon
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) 1610 NE Eastgate Blvd., Pullman, WA 99163 USA		5. TELEPHONE (include area code) (509) 335-5526	FOR OFFICIAL USE ONLY PVPO NUMBER 200200130
		6. FAX (include area code) (509) 335-7237	
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Corporation	8. IF INCORPORATED, GIVE STATE OF INCORPORATION Washington	9. DATE OF INCORPORATION July 7, 1939	FILING DATE MARCH 29, 2002
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Leona C. Fitzmaurice, Ph.D., Washington State University Research Foundation, 1610 NE Eastgate Blvd., Pullman, WA 99163 USA			FILING AND EXAMINATION FEES: \$ 2705.00 DATE 3/29/2002 CERTIFICATION FEE: \$ 320.00 DATE 6/11/02
11. TELEPHONE (include area code) (509) 335-4363	12. FAX (include area code) (509) 335-7237	13. E-MAIL fitzmaur@wsu.edu	14. CROP KIND (Common Name) Spring Wheat
15. GENUS AND SPECIES NAME OF CROP Triticum aestivum L.		16. FAMILY NAME (Botanical) Gramineae	17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,705), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)		19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 83(a) of the Plant Variety Protection Act <input type="checkbox"/> YES (If "yes", answer items 20 and 21 below) <input checked="" type="checkbox"/> NO (If "no", go to item 22)	
		20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
		21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? IF YES, SPECIFY THE <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED NUMBER 1,2,3, etc. (If additional explanation is necessary, please use the space indicated on the reverse.)	
22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL OR A HYBRID) PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)		23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)	
24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF OWNER 		SIGNATURE OF OWNER	
NAME (Please print or type) Leona Fitzmaurice		NAME (Please print or type)	
CAPACITY OR TITLE Executive Director	DATE March 26, 2002	CAPACITY OR TITLE	DATE

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (*in the sense that it will reproduce an entire plant*) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$2,705 \$320 filing fee and \$2,385 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 500, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$320 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvpo/pvp.htm>

TEM

- 18a. Give:
- (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
 - (2) the details of subsequent stages of selection and multiplication;
 - (3) evidence of uniformity and stability; and
 - (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
 - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 18c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 18e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
19. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
22. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
23. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

21. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

NA

22. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

WA007899 "Macon" has not been sold; Foundation seed will be available Spring 2002 (per Washington State Crop Improvement Association, 8/13/01).

23. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

NA

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center-East, Beltsville, MD 20705. Telephone: (301) 504-8089. <http://www.ams.usda.gov/lsg/seed/lis-sd.htm>

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this collection of information is (0581-0055). The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5984 (voice and TDD). USDA is an equal opportunity provider and employer.

S&T-470 (04-01) designed by the Plant Variety Protection Office with WordPerfect 6.0a. Replaces STD-470 (02-99) which is obsolete.

EXHIBIT A - ORIGIN AND BREEDING HISTORY**'MACON'**

1. Genealogy: Serra/Westbred 926//Tanager 'S' (PI 519878)/Pewee 'S' (PI 519819)

2. Stages of Selection and Multiplication:

1993: Final cross made: WSU campus greenhouse.

1994: F₁ generation; advanced in WSU campus greenhouse; all plants uniform. F₂ bulk population; increased in WSU campus greenhouse; F₃ seed bulk harvested; no selection applied.

1995: F₃ bulk population; WSU research land; selected 100 random spikes; no selection applied; segregating for maturity, plant height, and disease resistance.

1996: F₄ bulk population; WSU research land; no selection applied; segregating for maturity, plant height, and disease resistance.

1997: F₅ head row (F₄-derived); WSU research land; selected based on appropriate plant height, maturity, and disease resistance; no segregation within the single row.

1998: F₆ Single Plot Nursery (tested as HW000021); WSU research land; selected based on appropriate plant height, maturity, field resistance to leaf and stripe rust, grain protein content, test weight, grain yield, and milling/baking quality; no segregation within the plot.

1999: F₇ Preliminary Yield Trials; WSU research land; selected based on appropriate plant height, maturity, field resistance to leaf and stripe rust, grain protein content, test weight, grain yield, and milling/baking quality; no segregation within the plot.

One hundred (100) heads selected from F₇ field plots were threshed individually and resulting seed was sent to Crop and Food Research in Christchurch, New Zealand in September 1999 for advancement. Seed from each head was planted in a single row. Rows were inspected for phenotypic uniformity during the growing season, and non-conforming rows were removed prior to harvest. Individual rows were harvested separately and F₈ seed was returned to WSU in February of 2000, where seed from each row was inspected for phenotypic uniformity and class verification prior to bulking. A portion of the bulked seed lot was used to plant multi-location, replicated commercial variety trials for agronomic assessment. The remainder of the bulked seed (127 lb) was planted on 1.9 acres at the WSU-Othello Research Station in March 2000 for Breeder seed production. The field was inspected for phenotypic uniformity throughout the growing season, and non-conforming plants were removed prior to harvest.

EXHIBIT A - ORIGIN AND BREEDING HISTORY, cont.

2000: F₈ State Advanced Yield Trials and WSU Commercial Variety Trials, (tested as WA007899); selected based on appropriate plant height, maturity, field resistance to leaf and stripe rust, grain protein content, test weight, grain yield, and milling/baking quality; no segregation within the plot.

Breeder seed was bulk harvested in August of 2000, then was planted on six acres at the WSU-Othello Research Station in March 2001 to produce Foundation seed.

2001: F₉ WSU Commercial Variety Trials; Tri-State Variety Trials (WA, OR, ID), Western Regional Performance Nursery, Uniform Regional Performance Nursery; selected based on appropriate plant height, maturity, field resistance to leaf and stripe rust, grain protein content, test weight, grain yield, and milling/baking quality; no segregation within the plot.

2002: WA007899 released as the cultivar 'Macon': PI617072

3. Evidence of uniformity and stability:

Macon has been observed to be stable and uniform with respect to plant morphology since 1997 as an F₄-derived line. This represents five generations (1997-2001) through which this stability and uniformity have been observed.

4. Variants during reproduction:

Macon contains a red wheat variant that was observed at a level of 1 to 5 seeds per 1000 g in pre-breeder, breeder and foundation seed increases.

EXHIBIT B. – NOVELTY STATEMENT

Macon is most similar to Idaho377s and Winsome, which it is intended to supplant in the intermediate to high rainfall (>18 inches of average annual precipitation), non-irrigated production regions of eastern Washington based on its tolerance to the Hessian fly.

A. Agronomic Characteristics

Heading date and height data for Macon, Idaho377s and Winsome are described below.

1. Macon is earlier than Winsome (3 days) and has a heading date equivalent to Idaho377s under Washington State field conditions as shown in Table B1.
2. Macon is 1 inch taller than Winsome and equal to Idaho377s under Washington State field conditions as shown in Table B1.

Table B1. Heading date and plant height of Macon, Idaho377s, and Winsome in the commercial variety trial at 6 locations in Washington State in 2000.

Trait	Variety	Location						Avg.
		Lind	Ritzville	Pomeroy	Pullman	Fairfield	Royal Slope	
Heading (days after Jan 1)	Macon	151	162	166	168	174	149	162
	Idaho377s	151	161	168	169	173	148	162
	Winsome	152	165	170	175	176	152	165
Height (inches)	Macon	27	29	30	32	35	31	31
	Idaho377s	23	28	32	33	36	34	31
	Winsome	24	27	29	33	35	34	30

B. Genetic Characteristics

The novelty of Macon is demonstrated by microsatellite fingerprint data that differentiate Macon, Idaho377s and Winsome. The microsatellite *Xgwm570* is located on chromosome 6AL, between RFLP loci *Xfb b 192* (proximal) and *Xgb a20* (distal) (Röder et al., 1998). Amplification of *Xgwm570* reveals a 144 bp allele in Macon, whereas a 152 bp and 148 bp allele is present in Idaho377s and Winsome, respectively (Figure 1).

References:

Röder MS, V Korzun, K Wendehake, J Plaschke, M-H Tixier, P Leroy, and MW Ganal. 1998. A microsatellite map of wheat. *Genetics* 149:2007-2023.

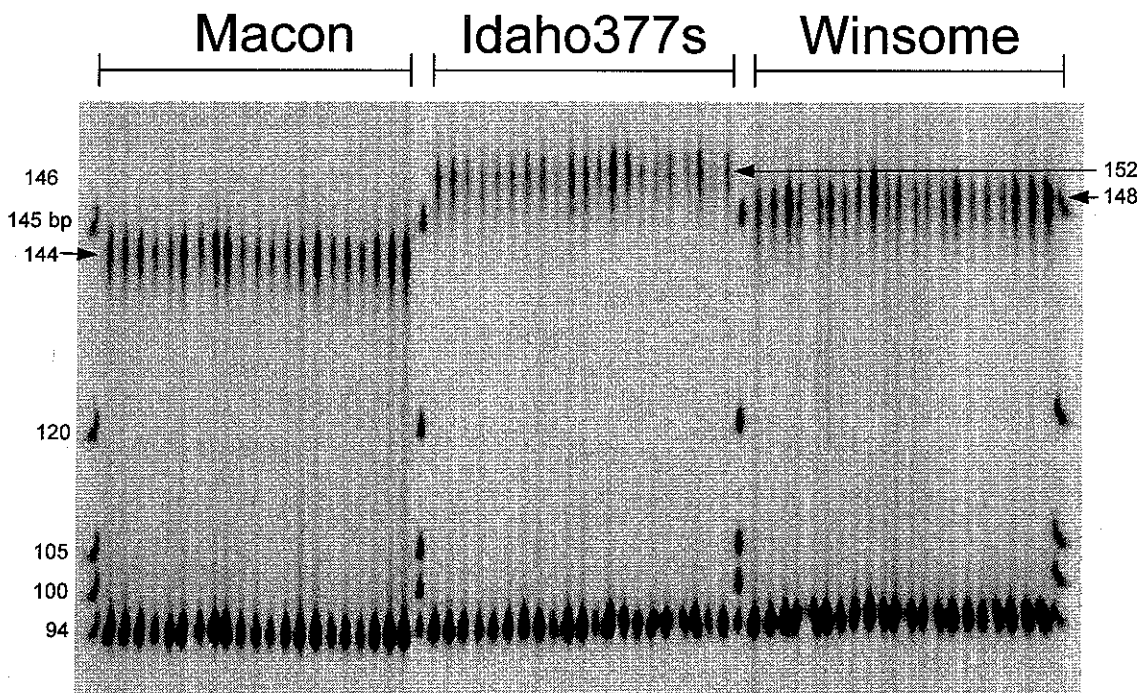


Figure 1. Microsatellite locus *Xgwm570* amplified from bulk (first lane of each cultivar) and individual progeny of Macon, Idaho377s and Winsome. Lanes 1, 23, 45 and 67 are molecular weight standards at 145, 120, 105, 100 and 94 basepairs. DNA was obtained from young leaf tissue; amplified products were resolved in denaturing polyacrylamide and visualized with an automated DNA Li-cor Sequencer (Li-cor, Lincoln, NE). The forward primer for *Xgwm570* was labeled with fluorescent dye detected at 700 nanometers.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this collection of information is (0543-0055). The time required to complete this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*Triticum* spp.)

NAME OF APPLICANT(S) Washington State University Research Foundation	FOR OFFICIAL USE ONLY
ADDRESS (Street and No. or RD No., City, State, and Zip Code) 1610 NE Eastgate Blvd, Pullman, WA 99163 USA	PVPO NUMBER 200200130
	VARIETY NAME
	TEMPORARY OR EXPERIMENTAL DESIGNATION

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g. or) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used. Please answer all questions for your variety; lack of response may delay progress of your application.

1. KIND:

1=Common

2=Durum

3=Club

4=Other (SPECIFY):

2. VERNALIZATION:

1=Spring

2=Winter

3=Other (SPECIFY):

3. COLEOPTILE ANTHOCYANIN:

1=Absent

2=Present

4. JUVENILE PLANT GROWTH:

1=Prostrate

2=Semi-erect

3=Erect

5. PLANT COLOR (boot stage):

1 = Yellow-Green

2 = Green

3 = Blue-Green

6. FLAG LEAF (boot stage):

1 = Erect

2 = Recurved

1 = Not Twisted

2 = Twisted

7. EAR EMERGENCE:

Number of Days Earlier Than Idaho 377s

Number of Days Later Than Klasic

8. ANTHOR COLOR:

1 = Yellow

2 = Purple

9. PLANT HEIGHT (from soil to top of head, excluding awns):

 cm Taller Than Klasic cm Shorter Than ID377s

* Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial

10. STEM:

A. ANTHOCYANIN

1 = Absent

2 = Present

B. WAXY BLOOM

1 = Absent

2 = Present

C. HAIRINESS (last internode of rachis)

1 = Absent

2 = Present

D. INTERNODE (SPECIFY NUMBER)

1 = Hollow

2 = Semi-solid

3 = Solid

E. PEDUNCLE

1 = Absent

2 = Present

cm Length

11. HEAD (at Maturity):

A. DENSITY

1 = Lax

2 = Middense

3 = Dense

B. SHAPE

1 = Tapering

2 = Strap

3 = Clavate

4 = Other (SPECIFY): _____

C. CURVATURE

1 = Erect

2 = Inclined

3 = Recurved

D. AWNEDNESS

1 = Awnless

2 = Apically Awnletted

3 = Awnletted

4 = Awned

12. GLUMES (at Maturity):

A. COLOR

1 = White

2 = Tan

3 = Other (SPECIFY): _____

C. BEAK

1 = Obtuse

2 = Acute

3 = Acuminate

B. SHOULDER

1 = Wanting

2 = Oblique

3 = Rounded

4 = Square

5 = Elevated

6 = Apiculate

D. LENGTH

1 = Short

2 = Medium

(ca. 7mm)

(ca. 8mm)

3 = Long (ca. 9mm)

E. WIDTH

- ☐ 3 1 = Narrow (ca. 3mm) 2 = Medium (ca. 3.5mm)
3 = Wide (ca. 4mm)

13. SEED:

A. SHAPE

- ☐ 3 1 = Ovate 2 = Oval 3 = Elliptical

C. BRUSH

- ☐ 1 1 = Short 2 = Medium 3 = Long
☐ 1 1 = Not Collared 2 = Collared

B. CHEEK

- ☐ 1 1 = Rounded 2 = Angular

D. CREASE

- ☐ 1 1 = Width 60% or less of Kernel
2 = Width 80% or less of Kernel
3 = Width Nearly as Wide as Kernel

☐ 1 1 = Depth 20% or less of Kernel
2 = Depth 35% or less of Kernel
3 = Depth 50% or less of Kernel

E. Color

- ☐ 1 1 = White 2 = Amber 3 = Red
4 = OTHER (Specify)

G. PHENOL REACTION (see instructions):

- ☐ 2 1 = Ivory 2 = Fawn
3 = Light Brown 4 = Dark Brown
5 = Black

F. TEXTURE

- ☐ 1 1 = Hard 2 = Soft

14. DISEASE: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

- | | |
|---|--|
| <input type="checkbox"/> 0 Stem Rust (<i>Puccinia graminis</i> f. sp. <i>tritici</i>) | <input type="checkbox"/> 0 Leaf Rust (<i>Puccinia recondita</i> f. sp. <i>tritici</i>) |
| <input type="checkbox"/> 3 Stripe Rust (<i>Puccinia striiformis</i>) | <input type="checkbox"/> 0 Loose Smut (<i>Ustilago tritici</i>) |
| <input type="checkbox"/> 0 Tan Spot (<i>Pyrenophora tritici-repentis</i>) | <input type="checkbox"/> 0 Flag Smut (<i>Urocystis agropyri</i>) |
| <input type="checkbox"/> 0 Halo Spot (<i>Selenophoma donacis</i>) | <input type="checkbox"/> 0 Common Bunt (<i>Tilletia tritici</i> or <i>T. laevis</i>) |
| <input type="checkbox"/> 0 <i>Septoria nodorum</i> (Glume Blotch) | <input type="checkbox"/> 0 Dwarf Bunt (<i>Tilletia controversa</i>) |
| <input type="checkbox"/> 0 <i>Septoria avenae</i> (Speckled Leaf Disease) | <input type="checkbox"/> 0 Karnal Bunt (<i>Tilletia indica</i>) |
| <input type="checkbox"/> 0 <i>Septoria tritici</i> (Speckled Leaf Blotch) | <input type="checkbox"/> 0 Powdery Mildew (<i>Erysiphe graminis</i> f. sp. <i>tritici</i>) |
| <input type="checkbox"/> 0 Scab (<i>Fusarium</i> spp.) | <input type="checkbox"/> 0 "Snow Molds" |

14. Disease (Continued) (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

- | | |
|---|---|
| <input type="checkbox"/> 0 "Black Point" (Kernel Smudge) | <input type="checkbox"/> 0 Common Root Rot (<i>Fusarium</i> , <i>Cochliobolus</i> and <i>Bipolaris</i> spp.) |
| <input type="checkbox"/> 0 Barley Yellow Dwarf Virus (BYDV) | <input type="checkbox"/> 1 Rhizoctonia Root Rot (<i>Rhizoctonia solani</i>) |
| <input type="checkbox"/> 0 Soilborne Mosaic Virus (SBMV) | <input type="checkbox"/> 0 Black Chaff (<i>Xanthomonas campestris</i> pv. <i>translucens</i>) |
| <input type="checkbox"/> 0 Wheat Yellow (Spindle Streak) Mosaic Virus | <input type="checkbox"/> 0 Bacterial Leaf Blight (<i>Pseudomonas syringae</i> pv. <i>syringae</i>) |
| <input type="checkbox"/> 0 Wheat Streak Mosaic Virus (WSMV) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Other (SPECIFY) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Other (SPECIFY) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Other (SPECIFY) | <input type="checkbox"/> Other (SPECIFY) |

15. INSECT: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

- | | |
|--|--|
| <input type="checkbox"/> 2 Hessian Fly (<i>Mayetiola destructor</i>) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> 0 Stem Sawfly (<i>Cephus</i> spp.) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> 0 Cereal Leaf Beetle (<i>Oulema melanopa</i>) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> 1 Russian Aphid (<i>Diuraphis noxia</i>) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> 0 Greenbug (<i>Schizaphis graminum</i>) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> 1 Aphids | <input type="checkbox"/> Other (SPECIFY) |

16. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS

EXHIBIT D – OPTIONAL SUPPORTING INFORMATION**Milling and Baking Quality:**

The end-use quality performance of Macon is compared with hard white spring wheat varieties Idaho377s and Winsome through t-test analyses (Table D1). The grain test weight of Macon is lower than that of Idaho377s, but similar to that of Winsome. The grain protein concentration of Macon is similar to those of Idaho377s and Winsome. Macon has a heavier (better) thousand kernel weight than those of Idaho377s and Winsome. The flour yields of Macon are significantly higher than those of Idaho377s and Winsome. The flour ash contents of the three varieties are similar. The milling score for Macon is higher (better) than those of Idaho377s and Winsome. The flour protein concentration of Macon is higher (better) than that of Winsome, but similar to that of Idaho377s. RVA values of Macon, which reflect starch quality, are similar to those of Winsome, but significantly lower than those of Idaho377s, a partial waxy type. Mixograph water absorption rates and baking absorption rates for Macon are similar to those for Idaho377s, but lower (poorer) than those for Winsome. The mixing time of flours extracted from the three varieties are similar. Macon has significantly larger (better) bread loaf volumes than Idaho377s and Winsome. The alkaline noodle sheet color properties of the three varieties are similar.

In general, Macon has superior end-use quality properties. Of particular note are its excellent flour extraction rates and large bread loaf volumes, demonstrating its superiority over other adapted hard white spring varieties from the region for milling and baking quality. Based on the L* values, this variety also has low polyphenol oxidase activity levels, which is beneficial when making various noodle products.

Table D1: Mean, least significant difference (LSD), probability level (P-value) and number of pair wise comparisons made (N) in t-test analyses for various end-use quality characteristics.

Variety	Test Weight (lb/bu)	Grain Protein (%)	Thousand Kernel Weight (g)	Flour Yield (%)	Flour Ash (%)	Milling Score	Flour Protein (%)	Flour RVA	Mixing Absorption (%)	Baking Absorption (%)	Mixing Time (min)	Loaf Volume (cc)	Alkaline Sheet L24 ANC L*
Macon	61.6	13.2	35.6*	67.8*	0.38	83.2*	11.8	199	61.6	64.6	4.8	1002*	79.6
Idaho377s	62.5*	13.2	33.9	64.5	0.39	79.5	11.7	236*	61.7	65.1	4.4	888	79.8
LSD	0.3	0.2	0.9	0.6	0.01	0.7	0.2	11	0.5	0.7	0.4	30	0.5
P-value	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N	23	23	23	23	23	23	23	19	22	21	21	21	21
Macon	61.0	13.1	34.3*	67.8*	0.38	83.1*	11.7*	200	61.5	64.7	4.9	1000*	79.6
Winsome	61.0	12.8	31.2	66.2	0.40	80.5	11.2	202	62.3*	66.8*	4.8	900	79.9
LSD	0.5	0.4	1.2	0.8	0.02	1.4	0.4	12	0.7	1.0	0.5	36	0.6
P-value	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N	14	14	14	14	14	14	14	14	14	14	14	14	14

*Significantly different at p = 0.05

200200130

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

EXHIBIT E

STATEMENT OF THE BASIS OF OWNERSHIP

1. NAME OF APPLICANT(S) Washington State University Research Foundation	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER WA007899	3. VARIETY NAME Macon
4. ADDRESS (include street no., city, state, ZIP, and country) 1610 NE Eastgate Blvd., Pullman, WA 99163 USA	5. TELEPHONE (include area code) (509) 335-5526	6. FAX (include area code) (509) 335-7237
7. PVP# NUMBER 200200130		

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain

☒ YES ☐ NO

9. Is the applicant (individual or company) a U.S. National or a U.S. based company? If no, give name of country

☒ YES ☐ NO10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?

☐ YES ☐ NO If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?

☒ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (If needed, use the reverse for extra space):

Macon was developed by Dr. Kimberlee K. Kidwell, Spring Wheat Breeder and Geneticist at Washington State University.

Washington State University's ownership interests are assigned to the Washington State Research Foundation.

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 6 minutes per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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